

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will ask questions that help them learn about the world:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Questions lead to action, including careful observation and testing; questions often begin with <i>“What happens if...?”</i> or <i>“How do these two things differ?”</i></p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge.</p>	<p><b>C-I.1.E.1:</b> Generate questions about the world based on observation.</p>		
<b>All students will design and conduct investigations using appropriate methodology and technology:</b>				
<b>WEATHER</b>	<p><b>KC:</b> (K-2) gather information, ask questions, think</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge.</p> <p><b>KC:</b> Manipulate simple devices that aid observations and data collection.</p> <p><b>RWC:</b> Any suggested in Using Scientific Knowledge benchmarks for which students would design and/or conduct investigations.</p> <p><b>KC:</b> Measurement units—milliliters, liters, teaspoon, tablespoon, ounce, cup, millimeter, centimeter, meter, gram.</p> <p><b>RWC:</b> Making simple mixtures, such as food, play dough, papier maché; measuring height of a person, weight of a ball.</p>	<p><b>C-I.1.E.2:</b> Develop solutions to problems through reasoning, observation, and investigations.</p> <p><b>C-I.1.E.3:</b> Manipulate simple devices that aid observation and data collection.</p> <p><b>C-I.1.E.4:</b> Use simple measurement devices to make measurements in scientific investigations.</p>		<p>Measuring cups and spoons Measuring tape Balance or scale</p> <p>Various data collection tools suitable for this level, such as hand lenses, wind direction indicators, grids for sampling areas of the sky or landscape.</p>
<b>All students will learn from books and other sources of information:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Develop strategies and skills for information gathering and problem solving.</p> <p><b>RWC:</b> Seeking help from or interviewing peers, adults, experts; using libraries, World Wide Web, CD's and other computer software, other sources.</p>	<p><b>C-I.1.E.5:</b> Develop strategies and skills for information gathering and problem solving.</p>		<p>Sources of information, such as reference books, trade books, magazines, web sites, other peoples' knowledge.</p>

# Science

# First Grade

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will communicate findings of investigations, using appropriate technology:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Increase, decrease, no change, bar graph, data table.</p> <p><b>RWC:</b> Examples of bar charts like those found in a newspaper.</p>	<p><b>C-I.1.E.6:</b> Construct charts and graphs and prepare summaries of observations.</p>		<p>Graph paper Rulers Crayons</p>
<b>All students will analyze claims for their scientific merit and explain how scientists decide what constitutes scientific knowledge:</b>				
<b>WEATHER</b>	<p><b>KC:</b> (K-2) observations</p> <p><b>RWC:</b> Deciding whether an explanation is supported by evidence in simple experiments, or relies on personal opinion.</p>	<p><b>R-II.1.E.1:</b> Develop an awareness of the need for evidence in making decisions scientifically.</p>		
<b>All students will show how science is related to other ways of knowing:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Poetry, expository work, painting, drawing, music, diagrams, graphs, charts.</p> <p><b>RWC:</b> Explaining simple experiments using paintings and drawings; describing natural phenomena scientifically and poetically.</p>	<p><b>R-II.1.E.2:</b> Show how science concepts can be illustrated through creative expression such as language arts and fine arts.</p>		
<b>All students will show how science and technology affect our society:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Provide faster and farther transportation and communication, organize information and solve problems, save time.</p> <p><b>RWC:</b> Cars, other machines, radios, telephones, computer games, calculators, appliances, e-mail, the World Wide Web.</p> <p><b>KC:</b> Appreciation of the balance of nature and the effects organisms have on each other, including the effects humans have on the natural world.</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge appropriate to elementary school.</p>	<p><b>R-II.1.E.3:</b> Describe ways in which technology is used in everyday life.</p> <p><b>R-II.1.E.4:</b> Develop an awareness of and sensitivity to the natural world.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will show how people of diverse cultures have contributed to and influenced developments in science:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Scientific contributions made by people of diverse cultures and backgrounds.</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge appropriate to this benchmark.</p>	<p><b>R-II.1.E.5:</b> Develop an awareness of contributions made to science by people of diverse backgrounds and cultures.</p>		
<b>All students will investigate and describe what makes up weather and how it changes from day to day, from season to season and over long periods of time:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Atmosphere is a blanket of air around the earth, air is a substance; see PME e-1 (attributes of substances). Air has temperature—cold, hot, warm, cool. Cloud cover—cloudy, partly cloudy; foggy. Precipitation—rain, snow, hail, freezing rain. Wind—breezy, windy, calm. Severe weather—thunderstorms, lightning, tornadoes, high winds, blizzards.</p> <p><b>RWC:</b> Daily changes in weather; examples of severe weather.</p> <p><b>KC:</b> Seasons and types of weather—fall, cool nights and warm days; winter—snowy and constantly cold, getting dark early in the evening; spring—warmer days, often rainy with thunderstorms; summer—hot days and warm nights, daylight lasting until late in the evening.</p> <p><b>RWC:</b> Examples of visible seasonal changes in nature.</p>	<p><b>EAW-V.3.E.1:</b> Describe weather conditions.</p> <p><b>EAW-V.3.E.2:</b> Describe seasonal changes in Michigan's weather.</p>		<p>Thermometer Wind sock Rain gauge Daily calendar activities</p>
<b>All students will analyze the relationships between human activities and the atmosphere:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Safety precautions—safe locations, sirens, radio broadcasts, severe weather watch and warning.</p> <p><b>RWC:</b> Examples of local severe weather, including thunderstorms, tornadoes and blizzards, examples of local community safety precautions, including weather bulletins and tornado sirens.</p>	<p><b>EAW-V.3.E.3:</b> Explain appropriate safety precautions during severe weather.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will describe the characteristics of water and demonstrate where water is found on earth:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Liquid (K-2)—visible, flowing, melting, dew. Solid (K-2)—hard, visible, freezing, ice. Gas See PCM e-1.</p> <p><b>RWC:</b> Examples of water in each state, including dew, rain, snow, ice, evidence of moisture in the air, such as “fog” on cold bathroom mirrors; examples of melting, freezing, and evaporating.</p>	<b>EH-V.2.E.2:</b> Describe how water exists on earth in three states.		
<b>All students will describe how water moves:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Precipitation—see EAW e-1. Flow—downhill, to rivers, into the ground. Bodies of water—streams, rivers, lakes, oceans. See EG e-1 (earth features).</p> <p><b>RWC:</b> Examples of water flowing locally, including gutters, drains, streams, wetlands.</p>	<b>EH-V.2.E.2:</b> Trace the path that rainwater follows after it falls.		
<b>All students will analyze the interaction of human activities with the hydrosphere:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Water sources—wells, springs, Great Lakes, rivers. Household uses—drinking, cleaning, food preparation. Public uses—generate electricity, recreation, irrigation, transportation, industry.</p> <p><b>RWC:</b> Examples of local sources of drinking water, including wells, rivers, lakes. Examples of local occasions when water is used, including car wash, swimming, fire hydrants, drinking, food preparation, cleaning, watering lawn, bathing, fishing, boating, shipping on the Great Lakes.</p>	<b>EH-V.2.E.3:</b> Identify sources of water and its uses.		
<b>All students will explain shadows, color, and other light phenomena:</b>				
<b>WEATHER</b>	<p><b>KC:</b> Shadow, blocked path, surface, object, light moves outward from the source in straight lines.</p> <p><b>RWC:</b> Shadows are made on surfaces by putting objects in the path of light from common sources, including sunlight, light bulbs, and projectors. Changes in size of shadows due to distance from the object.</p>	<b>PWV-IV.4.E.4:</b> Explain how shadows are made.		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will ask questions that help them learn about the world:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Questions lead to action, including careful observation and testing; questions often begin with <i>“What happens if...?”</i> or <i>“How do these two things differ?”</i></p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge.</p>	<p><b>C-I.1.E.1:</b> Generate questions about the world based on observation.</p>		
<b>All students will design and conduct investigations using appropriate methodology and technology:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> (K-2) gather information, ask questions, think</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge.</p> <p><b>KC:</b> Manipulate simple devices that aid observations and data collection.</p> <p><b>RWC:</b> Any suggested in Using Scientific Knowledge benchmarks for which students would design and/or conduct investigations.</p> <p><b>KC:</b> Measurement units—milliliters, liters, teaspoon, tablespoon, ounce, cup, millimeter, centimeter, meter, gram.</p> <p><b>RWC:</b> Making simple mixtures, such as food, play dough, papier maché; measuring height of a person, weight of a ball.</p>	<p><b>C-I.1.E.2:</b> Develop solutions to problems through reasoning, observation, and investigations.</p> <p><b>C-I.1.E.3:</b> Manipulate simple devices that aid observation and data collection.</p> <p><b>C-I.1.E.4:</b> Use simple measurement devices to make measurements in scientific investigations.</p>		<p>Measuring cups and spoons Measuring tape Balance or scale</p> <p>Various data collection tools suitable for this level, such as hand lenses, wind direction indicators, grids for sampling areas of the sky or landscape.</p>
<b>All students will learn from books and other sources of information:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Develop strategies and skills for information gathering and problem solving.</p> <p><b>RWC:</b> Seeking help from or interviewing peers, adults, experts; using libraries, World Wide Web, CD's and other computer software, other sources.</p>	<p><b>C-I.1.E.5:</b> Develop strategies and skills for information gathering and problem solving.</p>		
<b>All students will communicate findings of investigations, using appropriate technology:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Increase, decrease, no change, bar graph, data table.</p> <p><b>RWC:</b> Examples of bar charts like those found in a newspaper.</p>	<p><b>C-I.1.E.6:</b> Construct charts and graphs and prepare summaries of observations.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will analyze claims for their scientific merit and explain how scientists decide what constitutes scientific knowledge:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> (K-2) observations  <b>RWC:</b> Deciding whether an explanation is supported by evidence in simple experiments, or relies on personal opinion.</p>	<p><b>R-II.1.E.1:</b> Develop an awareness of the need for evidence in making decisions scientifically.</p>		
<b>All students will show how science is related to other ways of knowing:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Poetry, expository work, painting, drawing, music, diagrams, graphs, charts.  <b>RWC:</b> Explaining simple experiments using paintings and drawings; describing natural phenomena scientifically and poetically.</p>	<p><b>R-II.1.E.2:</b> Show how science concepts can be illustrated through creative expression such as language arts and fine arts.</p>		
<b>All students will show how science and technology affect our society:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Provide faster and farther transportation and communication, organize information and solve problems, save time.  <b>RWC:</b> Cars, other machines, radios, telephones, computer games, calculators, appliances, e-mail, the World Wide Web.</p> <p><b>KC:</b> Appreciation of the balance of nature and the effects organisms have on each other, including the effects humans have on the natural world.  <b>RWC:</b> Any in the sections on Using Scientific Knowledge appropriate to elementary school.</p>	<p><b>R-II.1.E.3:</b> Describe ways in which technology is used in everyday life.</p> <p><b>R-II.1.E.4:</b> Develop an awareness of and sensitivity to the natural world.</p>		
<b>All students will show how people of diverse cultures have contributed to and influenced developments in science:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Scientific contributions made by people of diverse cultures and backgrounds.  <b>RWC:</b> Any in the sections on Using Scientific Knowledge appropriate to this benchmark.</p>	<p><b>R-II.1.E.5:</b> Develop an awareness of contributions made to science by people of diverse backgrounds and cultures.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will use classification systems to describe groups of living things:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Observable characteristics—fur, scales, feathers, horns, claws, eyes, quills, beaks, teeth, skeleton, muscles, exoskeleton; functions—insulation, support, movement, food-getting, protection.</p> <p><b>RWC:</b> Vertebrate and invertebrate animals, such as humans, cows, sparrows, goldfish, spiders, crayfish, insects.</p> <p><b>KC:</b> Plant and animal parts—backbone, skin, shell, limbs, roots, leaves, stems, flowers, feathers, scales.</p> <p><b>RWC:</b> Animals that look similar—snakes, worms, millipedes; flowering and non-flowering plants; pine tree, oak tree, rose, algae.</p>	<p><b>LO-III.2.E.1:</b> Explain characteristics and functions of observable body parts in a variety of animals.</p> <p><b>LO-III.2.E.2:</b> Compare and contrast (K-2) or classify</p>		
<b>All students will compare and contrast differences in the life cycles of living things:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Life cycle stages—egg, young, adult; seed, plant, flower, fruit; larva, pupa.</p> <p><b>RWC:</b> Common plants and animals such as bean plants, apple trees, butterflies, grasshoppers, frogs, birds.</p>	<p><b>LO-III.2.E.3:</b> Describe life cycles of familiar organisms.</p>		
<b>All students will investigate and explain how living things obtain and use energy:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Life requirements—food, air, water, minerals, sunlight, space, habitat. See LEC e-2.</p> <p><b>RWC:</b> Germinating seeds, such as beans, corn; aquarium or terrarium life, such as guppy, goldfish, snail.</p>	<p><b>LO.III.2.E.4:</b> Compare and contrast food, energy, and environmental needs of selected organisms.</p>		
<b>All students will analyze how parts of living things are adapted to carry out specific functions:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Plant parts—roots, stems, leaves, flowers, fruits, seeds.</p> <p><b>RWC:</b> Common edible plant parts, such as bean, cauliflower, carrot, apple, tomato, spinach. (See LE e-2 about functions of selected animal body parts).</p>	<p><b>LO-III.2.E.5:</b> Explain functions of selected seed plant parts.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will investigate and explain how characteristics of living things are passed on through generations:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Characteristics—hair and feather color, eye color, leaf shape, flower structure.</p> <p><b>RWC:</b> Example of mature and immature organisms, such as dogs/puppies, cats/kittens, maple trees/saplings, beans/seedlings.</p>	<p><b>LH-III.3.E.1:</b> Give evidence that characteristics are passed from parents to young.</p>		
<b>All students will compare ways that living organisms are adapted (suited) to survive and reproduce in their environments and explain how species change through time:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Characteristics – adaptation, instinct, learning, habit. Traits and their adaptive values – sharp teeth or claws for catching and killing prey, color for camouflage, behaviors.</p> <p><b>RWC:</b> Common vertebrate adaptations, such as white polar bears, sharp claw and sharp canines for predators, changing and killing prey, color for camouflage, behaviors.</p>	<p><b>LE-III.4.E.2:</b> Explain how physical and behavioral characteristics of animals help them to survive in their environments.</p>		
<b>All students will analyze effects of technology on the earth’s surface and resources:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Materials that can be recycled – paper, metal, glass, plastic. Conservation and anti-pollution activities – reduce, reuse, and recycle.</p> <p><b>RWC:</b> Collections of recyclable materials, plans for recycling at home and school, composting, ways of reusing or reducing the use of paper.</p>	<p><b>EG-V.1.E.6:</b> Demonstrate ways to conserve natural resources and reduce pollution through reduction, reuse, and recycling of manufactured materials.</p>		
<b>All students will explain how parts of an ecosystem are related and how they interact:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Producer, consumer, predator, prey, decomposer, habitat, community.</p> <p><b>RWC:</b> Food chains and food webs involving organisms, such as rabbits, birds, snakes, grasshoppers, plants.</p>	<p><b>LEC-III.5.E.1:</b> Identify familiar organisms as part of a food chain or food web and describe their feeding relationships within the web.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will explain how energy is distributed to living things in an ecosystem:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Needs of life—food, habitat, water, shelter, air, light, minerals. See LO e-4.</p> <p><b>RWC:</b> Selected ecosystems, such as an aquarium, rotting log, terrarium, backyard, local pond or wetland, wood lot.</p>	<p><b>LEC-III.5.E.2:</b> Describe the basic requirements for all living things to maintain their existence.</p>		
<b>All students will investigate and explain how communities of living things change over a period of time:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Needs of life—food, habitat, water, shelter, air, light, minerals.</p> <p><b>RWC:</b> Ecosystems managed by humans, including farms, ranches, gardens, lawns, potted plants.</p>	<p><b>LEC-III.5.E.3:</b> Design systems that encourage growing of particular plants or animals.</p>		
<b>All students will analyze how humans and the environment interact:</b>				
<b>LIVING ORGANISMS</b>	<p><b>KC:</b> Human effects on the environment—garbage, habitat destruction, land management, renewable and non-renewable resources.</p> <p><b>RWC:</b> Household wastes, school wastes, waste water treatment, habitat destruction due to community growth, reforestation projects, establishing parks or other green spaces, recycling.</p>	<p><b>LEC-III.5.E.4:</b> Describe positive and negative effects of humans on the environment.</p>		
<b>All students will ask questions that help them learn about the world:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> Questions lead to action, including careful observation and testing; questions often begin with <i>“What happens if...?”</i> or <i>“How do these two things differ?”</i></p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge.</p>	<p><b>C-I.1.E.1:</b> Generate questions about the world based on observation.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will design and conduct investigations using appropriate methodology and technology:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> (K-2) gather information, ask questions, think</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge.</p> <p><b>KC:</b> Manipulate simple devices that aid observations and data collection.</p> <p><b>RWC:</b> Any suggested in Using Scientific Knowledge benchmarks for which students would design and/or conduct investigations.</p> <p><b>KC:</b> Measurement units—milliliters, liters, teaspoon, tablespoon, ounce, cup, millimeter, centimeter, meter, gram.</p> <p><b>RWC:</b> Making simple mixtures, such as food, play dough, papier maché; measuring height of a person, weight of a ball.</p>	<p><b>C-I.1.E.2:</b> Develop solutions to problems through reasoning, observation, and investigations.</p> <p><b>C-I.1.E.3:</b> Manipulate simple devices that aid observation and data collection.</p> <p><b>C-I.1.E.4:</b> Use simple measurement devices to make measurements in scientific investigations.</p>		<p>Measuring cups and spoons Measuring tape Balance or scale</p> <p>Various data collection tools suitable for this level, such as hand lenses, wind direction indicators, grids for sampling areas of the sky or landscape.</p>
<b>All students will learn from books and other sources of information:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> Develop strategies and skills for information gathering and problem solving.</p> <p><b>RWC:</b> Seeking help from or interviewing peers, adults, experts; using libraries, World Wide Web, CD's and other computer software, other sources.</p>	<p><b>C-I.1.E.-5:</b> Develop strategies and skills for information gathering and problem solving.</p>		<p>Sources of information, such as reference books, trade books, magazines, web sites, other peoples' knowledge.</p>
<b>All students will communicate findings of investigations, using appropriate technology:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> Increase, decrease, no change, bar graph, data table.</p> <p><b>RWC:</b> Examples of bar charts like those found in a newspaper.</p>	<p><b>C-I.1.E.6:</b> Construct charts and graphs and prepare summaries of observations.</p>		<p>Graph paper Rulers Crayons</p>
<b>All students will analyze claims for their scientific merit and explain how scientists decide what constitutes scientific knowledge:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> (K-2) observations</p> <p><b>RWC:</b> Deciding whether an explanation is supported by evidence in simple experiments, or relies on personal opinion.</p>	<p><b>R-II.1.E.1:</b> Develop an awareness of the need for evidence in making decisions scientifically.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will show how science is related to other ways of knowing:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> Poetry, expository work, painting, drawing, music, diagrams, graphs, charts.</p> <p><b>RWC:</b> Explaining simple experiments using paintings and drawings; describing natural phenomena scientifically and poetically.</p>	<p><b>R-II.1.E.2:</b> Show how science concepts can be illustrated through creative expression such as language arts and fine arts.</p>		
<b>All students will show how science and technology affect our society:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> Provide faster and farther transportation and communication, organize information and solve problems, save time.</p> <p><b>RWC:</b> Cars, other machines, radios, telephones, computer games, calculators, appliances, e-mail, the World Wide Web.</p> <p><b>KC:</b> Appreciation of the balance of nature and the effects organisms have on each other, including the effects humans have on the natural world.</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge appropriate to elementary school.</p>	<p><b>R-II.1.E.3:</b> Describe ways in which technology is used in everyday life.</p> <p><b>R-II.1.E.4:</b> Develop an awareness of and sensitivity to the natural world.</p>		
<b>All students will show how people of diverse cultures have contributed to and influenced developments in science:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> Scientific contributions made by people of diverse cultures and backgrounds.</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge appropriate to this benchmark.</p>	<p><b>R-II.1.E.5:</b> Develop an awareness of contributions made to science by people of diverse backgrounds and cultures.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will measure and describe the things around us:</b>				
<p><b>MATTER &amp; ENERGY</b></p>	<p><b>KC:</b> Texture— rough, smooth. Flexibility— rigid, stiff, firm, flexible, strong. Hardness. Smell— pleasant, unpleasant. States of matter— solid, liquid, gas. Magnetic properties— attract, repel, push, pull. Size— larger, smaller (K-2); length, width, height (3-5). Sink, float. Color— common color words. Shape— circle, square, triangle, rectangle, oval. Weight— heavy, light, heavier, lighter. See PWV e-4 (shadows: objects that let light pass through or block light); PME e-2 (materials that conduct electricity); C e-4 (use measuring devices). <b>RWC:</b> Common objects, such as desks, coins, pencils, buildings, snowflakes; common substances, including— solids, such as copper, iron, wood, plastic, styrofoam; liquids, such as water, alcohol, milk, juice; gases such as air, helium, water vapor.</p> <p><b>KC:</b> Useful properties – unbreakable, water-proof, light-weight, conducts electricity (see PME-IV.1.E.4, electrical circuits), conducts heat, attracted to a Magnet, clear. See EG-V.1.E.4 (uses of earth materials).</p> <p><b>RWC:</b> Appropriate selection of materials for a particular use, such as waterproof raincoat, cotton or wool for clothing, glass for windows, metal pan to conduct heat, copper wire to conduct electricity.</p>	<p><b>PME-IV.1.E.1:</b> Classify common objects and substances according to observable attributes/properties</p> <p><b>PME-IV.1.E.2:</b> Identify properties of materials which make them useful.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will identify and describe forms of energy:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> Heat, light, sound, food energy, energy of motion, electricity (see PCM-IV.2.E.1 about heat, PWV-IV.4.E.1-4 about light and sound, PME-IV.1.E.4 about electricity, LEC-III.5.E.2 about energy from food).</p> <p><b>RWC:</b> Appropriate selection of energy and phenomena, such as appliances like a toaster or iron that use electricity, sun's heat to melt chocolate, water wheels, wind-up toys, warmth of sun on skin, windmills, music form guitar, simple electrical circuits with batteries, bulbs and bells.</p>	<b>PME-IV.1.E.3:</b> Identify forms of energy associated with common phenomena		
<b>All students will investigate, describe and analyze ways in which changes:</b>				
<b>MATTER &amp; ENERGY</b>	<p><b>KC:</b> States of matter – solid, liquid, gas. Changes in size and shape - bending tearing, breaking. Processes that cause change of state: heating, cooling. See EH-V.2.E.1 (water in three states).</p> <p><b>RWC:</b> Changes in size or shape of familiar objects, such as making snowballs, breaking glass, crumbling cookies, making clay models, carving wood, breaking bones; changes in state of water or other substances, such as freezing of ice cream, or ponds, melting wax or steel, puddles drying up.</p> <p><b>KC:</b> Mixture, solution. Separation techniques--(K-2) filtration, using sieves, using magnets, floating vs. sinking;</p> <p><b>RWC:</b> Mixtures of various kinds – salt and pepper, iron filings and sand, sand and sugar, rocks and wood chips, sand and gravel, sugar or salt solutions.</p>	<p><b>PCM-IV.2.E.1:</b> Describe common physical changes in matter – size, shape, melting, freezing</p> <p><b>PCM-IV.2.E.2:</b> Prepare mixtures and separate them into their component parts: filtration, using sieves, using magnets, floating vs. sinking</p>		<p>Filter paper Funnels Magnets Sieves Beakers Solar stills</p>

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will ask questions that help them learn about the world:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> Questions lead to action, including careful observation and testing; questions often begin with <i>“What happens if...?”</i> or <i>“How do these two things differ?”</i></p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge.</p>	<p><b>C-I.1.E.1:</b> Generate questions about the world based on observation.</p>		
<b>All students will design and conduct investigations using appropriate methodology and technology:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> (K-2) gather information, ask questions, think</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge.</p> <p><b>KC:</b> Manipulate simple devices that aid observations and data collection.</p> <p><b>RWC:</b> Any suggested in Using Scientific Knowledge benchmarks for which students would design and/or conduct investigations.</p> <p><b>KC:</b> Measurement units—milliliters, liters, teaspoon, tablespoon, ounce, cup, millimeter, centimeter, meter, gram.</p> <p><b>RWC:</b> Making simple mixtures, such as food, play dough, papier maché; measuring height of a person, weight of a ball.</p>	<p><b>C-I.1.E.2:</b> Develop solutions to problems through reasoning, observation, and investigations.</p> <p><b>C-I.1.E.3:</b> Manipulate simple devices that aid observation and data collection.</p> <p><b>C-I.1.E.4:</b> Use simple measurement devices to make measurements in scientific investigations.</p>		<p>Measuring cups and spoons Measuring tape Balance or scale</p> <p>Various data collection tools suitable for this level, such as hand lenses, wind direction indicators, grids for sampling areas of the sky or landscape.</p>
<b>All students will learn from books and other sources of information:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> Develop strategies and skills for information gathering and problem solving.</p> <p><b>RWC:</b> Seeking help from or interviewing peers, adults, experts; using libraries, World Wide Web, CD's and other computer software, other sources.</p>	<p><b>C-I.1.E.-5:</b> Develop strategies and skills for information gathering and problem solving.</p>		<p>Sources of information, such as reference books, trade books, magazines, web sites, other peoples' knowledge.</p>

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will communicate findings of investigations, using appropriate technology:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> Increase, decrease, no change, bar graph, data table.  <b>RWC:</b> Examples of bar charts like those found in a newspaper.</p>	<p><b>C-I.1.E.6:</b> Construct charts and graphs and prepare summaries of observations.</p>		<p>Graph paper Rulers Crayons</p>
<b>All students will analyze claims for their scientific merit and explain how scientists decide what constitutes scientific knowledge:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> (K-2) observations  <b>RWC:</b> Deciding whether an explanation is supported by evidence in simple experiments, or relies on personal opinion.</p>	<p><b>R-II.1.E.1:</b> Develop an awareness of the need for evidence in making decisions scientifically.</p>		
<b>All students will show how science is related to other ways of knowing:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> Poetry, expository work, painting, drawing, music, diagrams, graphs, charts.  <b>RWC:</b> Explaining simple experiments using paintings and drawings; describing natural phenomena scientifically and poetically.</p>	<p><b>R-II.1.E.2:</b> Show how science concepts can be illustrated through creative expression such as language arts and fine arts.</p>		
<b>All students will show how science and technology affect our society:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> Provide faster and farther transportation and communication, organize information and solve problems, save time.  <b>RWC:</b> Cars, other machines, radios, telephones, computer games, calculators, appliances, e-mail, the World Wide Web.</p> <p><b>KC:</b> Appreciation of the balance of nature and the effects organisms have on each other, including the effects humans have on the natural world.  <b>RWC:</b> Any in the sections on Using Scientific Knowledge appropriate to elementary school.</p>	<p><b>R-II.1.E.3:</b> Describe ways in which technology is used in everyday life.</p> <p><b>R-II.1.E.4:</b> Develop an awareness of and sensitivity to the natural world.</p>		

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will show how people of diverse cultures have contributed to and influenced developments in science:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> Scientific contributions made by people of diverse cultures and backgrounds.</p> <p><b>RWC:</b> Any in the sections on Using Scientific Knowledge appropriate to this benchmark.</p>	<p><b>R-II.1.E.5:</b> Develop an awareness of contributions made to science by people of diverse backgrounds and cultures.</p>		
<b>All students will describe how things around us move, explain why things move as they do and demonstrate and explain how we control the motions of objects:</b>				
<b>MOTION &amp; MAGNETS</b>	<p><b>KC:</b> Words – east, west, north, south, right, left, up, down. Speed words – fast, slow, faster, slower.</p> <p><b>RWC:</b> Motions of familiar objects in two dimensions, including rolling or thrown balls, wheeled vehicles, sliding objects.</p> <p><b>KC:</b> Changes in motion – speeding up, slowing down, turning. Common forces - push, pull, friction, gravity. Size of change is related to strength of push and pull.</p> <p><b>RWC:</b> Playing ball, moving chairs, sliding objects.</p> <p><b>KC:</b> Magnetic poles, magnetic attraction and repulsion.</p> <p><b>RWC:</b> Common magnets, using a magnetic compass to find directions.</p> <p><b>KC:</b> Inclined planes, levers, pulleys, wedges, wheel and axle, force, distance.</p> <p><b>RWC:</b> Block and tackles, ramps, screwdrivers and screws, can openers, seesaws.</p> <p><b>KC:</b> Names and uses for parts of machines, such as levers, wheel and axles, pulleys, inclined planes, gears, screws, and wedges.</p> <p><b>RWC:</b> Simple mechanical devices, such as bicycles, bicycle pumps, pulleys, faucets, clothespins, can openers.</p>	<p><b>PMO-IV.3.E.1:</b> Describe or compare motions of common objects in terms of speed and direction.</p> <p><b>PMO-IV.3.E.2:</b> Explain how forces (pushes or pulls) are needed to speed up, slow down, stop, or change the direction of a moving object.</p> <p><b>PMO-IV.3.E.3:</b> Describe patterns of interaction of magnetic materials with other magnetic and non-magnetic materials.</p> <p><b>PMO-IV.3.E.4:</b> Identify and use simple machines and describe how they change effort.</p> <p><b>PMO-IV.3.E.5:</b> Manipulate simple mechanical devices and explain how their parts work together.</p>		<p>Magnets Variety of magnetic and non-magnetic materials</p>

# Science

# First Grade

UNIT TITLE	CORE TOPICS (Key Concepts & Real World Contexts)	UNIT BENCHMARKS	SUGGESTED ASSESSMENT	POSSIBLE RESOURCES
<b>All students will explain how electricity (and Magnetism) interacts with matter.</b>				
<b>HEALTH</b>	<p><b>KC:</b> Shock, wall outlet, hazards; see PME-IV.1.E.3 (electrical energy).  <b>RWC:</b> Electric outlets, power lines, frayed electric cords, electric appliances, lightning, hair dryers in sinks and tubs.</p>	<p><b>PME-IV.1.E.5:</b> Describe possible electrical hazards to be avoided at home and at school.</p>		
<b>All students will describe sound and sound waves.</b>				
<b>MUSIC</b>	<p><b>KC:</b> Properties: pitch – high, low. Loudness – loud, soft.  <b>RWC:</b> Sound from common sources, such as musical instruments, radio, television, animal sounds, thunder, and human voices.</p> <p><b>KC:</b> Vibration – fast, slow, large, small.  <b>RWC:</b> Sound from common sources, such as musical instruments, radio, television, animal sounds, thunder, and human voices.</p>	<p><b>PWV.4.E.1:</b> Describe sounds in terms of their properties.</p> <p><b>PWV.4.E.2:</b> Explain how sounds are made.</p>		